LOGISTICS IMPLICATIONS OF FUTURE CHANGES IN GROCERY RETAILING

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INTRODUCTION

This report is a synthesis of views and reactions to the previously reported Delphi exercise. Because it is a synthesis of a number of views its approach is, of necessity, general.

The report examines the likely implications of forecast changes of specific aspects of retailing. In addition to the Delphi forecast, statistical data from Government and other sources is introduced to expand and increase the usefulness of the exercise.

Following the consideration of future retailing patterns in terms of physical distribution changes both manufacturers and retailers distribution system developments are discussed. This discussion is based around distribution activity centres. In some areas the discussion overlaps both manufacturers' and retailers' systems (e.g., communications - linked inventory control systems).

First of all however, the environmental background must be considered. It is against a backdrop of increasing concern for the problems of urban congestion, conservation and the "quality of life", that future physical distribution must be seen.

THE ENVIRONMENT

The Delphi forecast suggested that Government involvement in distribution is likely in the near future. Members of the industry consider this so for a number of reasons.

There are two areas for consideration. First, without a clear lead from central Government on the development (or restriction) of Out of Town Retailing, it is likely that protective legislation will come to the aid of the City Centre. Primarily this will be aimed at decreasing urban congestion and the protection and preservation of some small and attractive locations.

Examples of both are easy to find. In the first instance attention is focussed on the recent Dykes Bill which requires Local Authorities to advise Central Government of proposals for prohibited or restricted commercial vehicle movement areas. Currently the bill is based on an unladen weight of 3 ton and its likely effects are considered by manufacturers to result in still more congestion. This is thought likely because despite the fact that some retail trade will be located in out of town areas, there will still be the vast majority of it in the City Centres. Thus to reduce the permissable vehicle capacity, can only result in more vehicle movements, either by more vehicles or by more journeys per vehicle. It has been suggested that the 3 ton weight restriction will result in large cost increases, for example, if applied to a refrigerated vehicle it would mean that only half the normal payload could be carried at the existing cost. It has been suggested that if city centres are still responsible for the bulk of food deliveries by 1980 real problems will exist.

The alternative is to restrict delivery hours. It was forecast that this would be likely by 1977 for deliveries between 6 p.m. and 10 p.m. and 1980 for an extension to 6 a.m. in urban areas. This presents a number of problems.

This group argues that government influence (by actual or threatened legislation) will cause an increase in the use, together with the ever increasing costs of brands deliveries. It is a fact that although average deliveries size is increasing (currently 30-50 cases), it is still an uneconomic size for a single drop. Thus the argument is that consolidation converts these uneconomic sizes into economic loads. It is further argued that consolidation enables the delivery specifications of customers to be matched with those of retailers and that because an increasing number of retailers check all deliveries, consolidation reduces their administration and control problems.

Environmental considerations include legislative reaction towards out of town retailing. At present no policy exists to govern locational development. The Department of the Environment has requested that planning applications in excess of 50000 sq. ft. be referred to them, and in recent months have allowed appeals for an out of town hypermarket development and a smaller edge of town unit. In each instance it was made clear that precedents were <u>not</u> being established. Some opinion considered that recently elected provincial Labour controlled councils may view out of town developments more enthusiastically than Conservative predecessors because of the pricing policies offered by the larger units will offer consumers lower overall food prices. Superstore operators (hypermarket) suggest that depending upon the product price savings will vary between 3% and 8%.

Despite planning permission difficulties there is considerable activity. The Birkenhead Coop has one operational superstore and nine others in the course of building or advanced planning. Asda and Sainsbury have a number of superstores in advanced stages of planning. A possible indication of a change in some planning authorities views was apparent at a seminar organized by Investment and Property Studies by Cheshire's Deputy Planning Manager who acknowledged that grocery shopping should be taken out of the High Street because of the enormous traffic problem it creates.

There has been considerable misunderstanding concerning what comprises a superstore (or hypermarket). Much of the existing confusion is caused by making comparisons with overseas activities without considering other environmental circumstances. For example, many of the North American out of town units are in fact in suburban locations while the French hypermarkets are "greenfield" operations simply because of greater land resources. In fact many will very soon become not "out of town" operations but "off centre" or "edge of town" as the rapid pace of urban development encloses them.

Furthermore there appears to be "fear of the unknown" among planners and conventional grocery retailers. This is due largely to the fact that no time trend data exists to illustrate the effects of these large units on the smaller grocery stores, which in any event have been declining in numbers over a very long period and thus it would be very difficult to isolate the particular effects of the larger stores.

There have been a number of estimates of the likely number of "green field" superstores. Carrefour are reported to have estimated some 48 units of 100,000 sq.ft. Hypermarket Holdings estimate around 100 by 1980. The Delphi exercise forecast 30 by 1980 and a total of 75 by 1990.

Possibly more important than actual numbers is likely volume of business handled. The Hypermarket Holdings estimate, based on 100 units would represent less than 5% of the national retail sales volume.

An estimate of the grocery sales volume can be made by using Nielsen data (2) and the forecast data of the Delphi exercise. Neilson estimated that in April 1971, there were 73 Mass Merchandisers:

> " .... outlets with over 10000 sq.ft. of selling area carrying a broad range of merchandise that do not qualify as Department Stores" (2)

The average selling area was:

for the total store	19700 sq.ft (73 outlets)
for groceries	8100 sq.ft.(70 outlets)

They estimated that each of the 70 Mass Merchandisers handling food averages an annual grocery turnover of £1¼ million which represents 2.5% of the annual turnover of Britain's grocers.

Relating this to the Delphi exercise the Mass Merchandiser Category would appear to include:

Supermarkets in out of town locations
Superstores in out of town locations
Supermarkets in suburban areas

The percentage sales developments forecast for 1980 and 1990 for each was:

	1980	1990
Supermarkets in out of town locations	50	80
Superstores in out of town locations	100	200
Supermarkets in suburban areas	40	50
	190	330

Thus when this is related to the Nielsen data we have estimated percentage and £ sterling values of:

	1980	1990
Percentage of Total Grocery sales	7.75	8.25
£ (1971 prices)	£166.25 million	£288.75 million

Because of inflation problems the £ sterling projections are of doubtful value but nevertheless of interest.

The number of outlets within the type of store covered by the Nielsen survey corresponds to the size ranges detailed with projected percentage increase rates below:

	1980	1990
Over 25000 sq. ft.	50	200
15000 - 24999 sq.ft.	60	100
8000 - 14999 sq.ft.	110	300

Therefore again related to the Nielsen data, we have:

By 1980 140 superstore type outlets
By 1990 240 superstore type outlets

However, this projection is not too realistic because it is based on stores smaller than the accepted size for consideration as superstores and therefore overstates the situation. Unfortunately, no reliable data exists detailing current store sizes.

It is interesting to note that in 1971, over 72% of stores opened were less than 10000 sq.ft. in area while for 1970 the figure was 76%. Additional information can be obtained from the 1973 preliminary statement from Sainsbury where in 1973 the average store size, at 9690 sq. ft is less than 1000 sq.ft. (3)

This all tends to suggest that far from a proliferation of giant superstores around the United Kingdom, there numbers will be relatively small and as can be seen here, their share of the total grocery business will be equally small. This is confirmed by press reports of joint ventures for superstore developments by supermarketing grocery firms and departmental stores, e.g. Keymarkets/Selfridges; Allied Suppliers/A.Goldberg, and Tesco/House of Fraser. This suggests that demarcation lines between supermarkets and departmental stores are less than they were in the past and that non-foods are looked upon as a growth area. (4) It also suggests that the numbers of superstores will be

This view has general support among those visited in this exercise. Additional factors suggest that the recent changes in local government organization may eventually lead to a change in financial organization and funds sources which could relax the pressure on (and proportions of) rateable values as a source of income. But this is a very long term view.

Another view supporting this likely development trend is the availability of and lack of attention of property developers to, the edge of town, peripheral store property which has planning permission for retail shopping use and which could be assembled into larger units. The view maintains that this could have particular appeal to local authorities because the rateable value would likely as not be higher (a clear case of 2 + 2 = 5, if not for the wrong reasons) and the costs of administration and collection would clearly be lower.

The attraction of the high street for retailers would seem to support the view that it will survive for some time. A recent report, (5) suggests that demand is particularly high for space in suburban high streets, despite rent increases of 50% and more since 1971.

Recently some of the major city centre chains have announced expansion plans. Marks and Spencer are to spend £25 million on new stores during 1973 and British Home Stores plan to open 25 new stores. There can be little doubt then that the city centres around U.K. will survive provided that they can offer car parking facilities. Car parking is a particular problem in some areas and it is inadequacies in this area which are likely to tip the balance in favour of edge of town developments to satisfy the increasing number of car borne shoppers.

It is interesting to note that it is from consumer durables, clothing and footwear retailers that the demand is mostly coming from. This supports the view held by many that in the future the city centres will be popular for "comparison shopping" of these more expensive items and that these are the types of products whose gross margins will be sufficiently high enough to enable high rental costs to be met. Some commentators dampen the enthusiasm a little by suggesting that the rates are high because of increased consumer expenditure, a "boom" in fact, and the dividend restraint and profit margin control having left large retailing groups with large amounts of cash. They suggest that in the long term these rents may be hard to meet.

Views on the "convenience store" in suburban centres are unanimous. These can be expected to survive and some, through amalgamation and population shifts, can be expected to increase in size. It can be expected that in most instances these will be symbol group operators.

Other possible legislative changes are anticipated.

It has been suggested that eventual control of profit margins is likely. The reasoning behind this is that government, in order to come closer to the unions, may propose profit restraint to compensate for a full wages and prices control in an integrated Prices and Incomes Policy with which it will be able to add "fine tuning" to economic policy. This will undoubtedly have implications for physical distribution. If profits were to be restricted manufacturers may look to more capital intensive distribution systems and retailers could become less discount oriented and trade-off service for price concessions.

Open dating is seen as a real possibility. The ramifications of this are obvious. Emphasis on stock turn and lower inventory holding will be necessary for perishable products. The techniques and equipment developed will undoubtedly be used on other items in the product range.

For some time a British equivalent to the U.S. Robinson-Patman Act has been discussed. It is considered by some that as government becomes more involved in regulating industry and commerce, then fair competition between large and small retailers is one topic likely to come under review. This too has logistics implications. If manufacturers are eventually forced into justifying trade discounts in terms of operational economies of scale, then clearly distribution is one such area which can be used, because delivery frequency and drop size are obvious economic variables.

Industrial relations is another area of legislative development. The current legislation cannot be evaluated as yet but it is likely that board level representation of unions will eventually occur. It appears to work well in West Germany and could appear as E.E.C. law. Furthermore, the Union movement could expand still further to include salesmen and as they are an integral part of a manufacturers distribution system (who controls their activities is immaterial) this move could have effects which would eventually be felt in the distribution system.

The final aspect of the environment to be considered here (the word final does not imply that there are no other aspects, only that those discussed thus far appear to be the most influential) is the rapid growth of leisure. Not only is this important in terms of its likely effect on product development i.e. of more convenience foods which reduce still further the labour received in preparation, but also in increasing the rate of proliferation of products aimed to reflect a growing cosmopolitan demand cultivated by increasing holidays abroad. The growth of the demand for leisure also has implications for manufacturers'

and retailers' personnel policies. Possibly the most significant effect is likely to be its effect on the independent grocers, many of whom are "old hands" and store owners, all of whom are prepared to work a six day week. An interesting research topic would be to establish the average ages of these people and to determine their attitudes and motivations. One hypothesis that has been offered is that the average age is high and that their successors are unlikely to share their enthusiasm for work and long hours and this could be a contributory factor to the continuing decline of the independent.

These then are a few of the environmental influences at work on grocery product distribution. As has been shown almost all of them are likely to have an effect on physical distribution. The predicted changes in grocery retailing are now examined in terms of their logistics implications.

LOGISTICS IMPLICATIONS OF GROCERY PRODUCT RETAILING CHANGES

Changes in Product volumes and Product Types

The proportion of food expenditure, as a proportion of total consumers expenditure is expected to decrease steadily throughout the forecast period. Thus from 21.3% in 1970 the 1980 prediction is for a decrease to 19.0% and to 15.5% by 1990.

No meaningful estimate can be made of the likely value of these amounts. Much depends upon the values of overall inflation and relative inflation between product groups. A continued high inflation rate for all products would probably mean that generally more would be spent on food as other items, durables etc. would appear to be expensive in relation to food for the average family. On the other hand a low rate of overall inflation would probably influence expenditure towards durable goods. Clearly differential rates would influence expenditure in different ways, and there is no reason to suppose that Engel will be proved wrong by either 1980 or 1990. Much will depend upon the sustained rate of economic growth eventually achieved.

What is likely is a change in the volumes of food products consumed. A recent exercise, based on regression analysis of past consumption trends suggests some startling changes (6)

Average total consumption is expected to decrease from the present 290 ozs per person per week to 270 ozs. Within this total decrease the variety of food consumed is changing. Thus by the year 2000 broad changes will occur: away from cereals and sugar towards meat, eggs and cheese, away from vegetables towards fruit.

Currently bread and cereals represent one fifth of total consumption, these are likely to decrease to one eigth by the end of the century. In absolute terms the weight consumed could fall by nearly half from 62 ozs currently to 33 ozs per week. Within this category the ready-to-eat products are increasing in proportion while, if the trends continue, home cooking cereal products - flour oatmeal and rice - may disappear from the budget completely by the end of the century.

Meat products are likely to increase in volume, from the present 39 ozs per person per week to nearly 49 ozs. Variety within the total is changing. Currently the largest proportion is carcass meat, 42%, and poultry is low at 12%. By the end of the century these may be 25% carcass meat, and 29% poultry. Cooked, canned and other meat products are expected to increase from 19% to 23%.

Some other changes likely suggest:

1. Wet fish and processed fish will disappear
2. Butter consumption will eliminate margarine
3. A decrease in sugar and preserves consumption by one third, 19.4 ozs. to 13.4 ozs. Sugar, consumed as sugar will decrease from 16.7 ozs to 13.0 ozs.
4. An increase of 50% in coffee consumed in the home.
5. Tea drinking will decrease by 25% but will remain well ahead of coffee in terms of consumption per head.

These changes (if they occur) will have some effects on distribution systems. For some products, those whose volume is expected to decrease drastically (or even vanish), retailer attitudes will change and some whose volume currently justifies direct bulk deliveries may become slow moving items and may require entirely different delivery and unitization programmes.

At the same time product lines are increasing. There are two basic reasons for this. First, manufacturers are continuing to increase new products, mostly convenience food items which for the most part are slow, at best medium, movers and hence at the retail level there is a tendency for inventory holding to increase despite continual product rationalization. Secondly, manufacturers tend to attempt to "stretch the product life-cycle" by introducing flavour and pack size varieties of hitherto successful products in an attempt to continue a profits flow from the product.

The results of these pressures on the retailer have been wide-spread and general in their influence. Most retailers have space problems and therefore they have reacted predictably.

First, as already stated many have introduced product rationalization into their operational procedures. This is done either by E.D.P. where the computer is programmed to draw attention to a slackening sales rate or manually. In either instance action is taken; either to discontinue selling the product; or to adjust inventory holding and buying quantities. Where space problems are acute the product may be discontinued in certain branches.

The second reaction is to adjust the ranges of products sold by pack size. Thus it is likely to become an increasing tendency to find retailers stocking an own brand in a variety of sizes together with one or two national brands in carefully selected supporting sizes, with no overlap in size coverage. Many retailers are conducting size rationalization programmes as well as product type, as the trend towards consumer preference for large pack sizes continues.

The third reaction is a combined result of the previous two. The larger, more sophisticated retailers become, the more control they are able to exercise. Thus an increase is likely in unit profitability control and more and more centralized control is likely to appear over shelf allocation as well as product range coverage in individual stores. Thus not only will branch outlets be graded and order levels predetermined but specific shelf space allocations will be made and profit targets set accordingly.

The implications are clear. In general retailers' stock control will be more efficient, stock levels will generally be reduced. Manufacturers, therefore, can expect to either hold more inventory or to provide more frequent deliveries as these operational efficiencies become improved and more widely implemented.

Convenience Foods

The Delphi exercise predicted substantial growth in overall sales of convenience foods and for specific convenience food types. Overall the convenience share of all grocery sales will increase from 27.8% in 1970 to 33% in 1980 and 36% in 1990. The most dramatic growth is expected in frozen foods and accelerated freeze dried products. Frozen foods can be expected to increase 50% by 1980 and double by 1990. A.F.D. products can expect to show a 25% increase by 1980 and 50% by 1990. The Crompton Partners publication (6), suggests that quick frozen fish will account for half the fish eaten. Quick frozen vegetables will also gain popularity. After what appeared to be a slump in sales, frozen foods are again expanding and together with the dramatic increase in home freezer sales, the trends appear to be very much those of expansion. It is estimated that by the end of 1973 nearly two million homes will own freezers - a leap from 7.8% in 1972 to 11.0% of all British Homes (7)

Transport and storage of frozen products will require attention for a number of reasons. If demand increases manufacturers will need to consider expanding system capacity or delivery frequency in order to maintain service. However, as it has been seen delivery restrictions may operate in terms of vehicle size (thus restricting capacity) or delivery time periods (thereby restricting frequency). This of course refers to the Dykes Bill.

A.F.D. products present other problems. For example, these have no perishability problems but an increase in product range will increase inventory management problems, particularly as the majority of these products are not fast moving items. Furthermore the cubic weight volume ratio is decreasing steadily making more warehouse cube essential in the future.

On the plus side there would appear two advantages. First advantage is that A.F.D. products are lighter and therefore handling throughout the system is facilitated and, in the long run may reduce (albeit slightly) capital expenditure on handling equipment. Second, A.F.D. products are flexible as far as packaging is concerned and thus offer an opportunity of pack design to obtain better cube utilisation.

Pack Size Considerations

Mention has already been made of the current trend among larger retailers to rationalize pack sizes within product groups, which ultimately will increase cube utilization throught the distribution process, because deliveries to specific retailers will be in larger volumes with fewer pack size variations. There are of course other considerations.

First of all there has been a noticeable increasing trend for consumers to buy larger pack sizes. For example, this trend has been a marked one in pet food sales where the trend for large pack sales has been a rapidly increasing one. Instant coffee sales by pack size have changed. The 2oz size is no longer a

fast moving item and best selling pack. It has been replaced by the 4 oz size as best seller and the 8 oz size in second place.

This trend is also confirmed by the increasing numbers of catering size packs being sold to consumers through supermarket outlets. Household goods too, disinfectants and cleaning materials, find similar trends with demand increasing for pack sizes classified as and sold to "industrial" outlets.

Eventual pack size standardization is considered very unlikely because of product density problems, and promotional aspects. However, it is interesting to note that there are plans within the E.E.C. to introduce weight range steps (e.g. 150 grm, 250 grms etc) and this fact together with the change to metrication could provide an opportunity for some move towards a degree of standardization.

The logistics implications of pack sizes on logistics systems is clear. A proliferation of pack sizes and shapes is clearly uneconomic at the retail level and causes problems for manufacturers although some standardization of sizes is possible. However, it seems unlikely that the alleged promotional advantages from variable pack shapes and sizes will give much ground to cube economics in distribution, and is a problem to be lived with.

An additional problem, unless manufacturers exercise strict rationalization controls, will be the fact that our increasing range of larger pack sizes could add to cube utilization problems. This could be a problem in production scheduling as well, but the same solution would ameliorate the problem for production as well as distribution.

One final point on this topic. The trend may not prove to be profitable for all manufacturers. Larger packs means less frequent sales. For some product types the decrease in frequency may not mean a loss of revenue or a balance between size and frequency. It could even mean an increase. But just as important is the volume/value relationship. Packaging is expensive and for some low value high volume products the economics of packaging may involve higher proportional costs and thus although consumer demand may be present, unless the profitability of the product weight/product value is acceptable the advantages of cube economics may not be worthwhile.

Own Brands

An increase in own brands sales was forecast by the Delphi exercise. Multiples' own brand sales are expected to increase from 12/14% in 1970 to 20% by 1980 and 24% by 1990. Co-op own brand sales, estimated at 9/10% in 1970 are likely to be 15% in 1980 and 20% by 1990. Symbol Independents at 2/3% in 1970 can expect an increase to 5% in 1980 and 8% in 1990.

The philosophy of own brands is currently undergoing a period of change. Hitherto, it was an ideal concept for both manufacturer and retailer. Initially manufacturers found own brands an economic aspect of their operations. They (own brand products) filled some excess capacity and provided relatively long production runs. Deliveries were most often in bulk to central locations and while the argument that advertising costs were eliminated (albeit marginally) was not accepted by all, there were no in store merchandising costs.

Retailers found own brands ideal. They offered larger gross margins and they enabled the retailers to build their own store images.

As they expanded so did the problems. Antagonism between manufacturer and retailer appeared as a larger proportion of the manufacturers production began to compete with itself on the Multiples' shelves. They counter argued that their own brand activities expanded product sales to the mutual benefit of both.

There are a number of reasons to suggest that some change is taking place.

On the retailing side product line rationalization is including own brands. One multiple has appointed an own brands product manager to ensure profitability from the area. The general attitude appears to be that manufacturers are better equipped to develop new products and modify existing ones and that retailers interests are best served by cooperating with manufacturers in future to develop volume markets.

On the store image aspect of own brand activity it is considered that, service, price and quality aspects of a stores image with its customers are most easily developed by own brands but this requires promotional investments and lately the price differentials between own brands and national brands has got less.

The own brand "price/quality equation" has, overall tended to reflect this change in retailer attitude and where a 90-95% of leading brand quality and 80% of price equation operated, quality is now increasing and consequently so is price. This together with increased promotional costs has narrowed the "price gap". It is recognized that overall quality must be uniform across the product range, for one failure would damage the entire programme. Some may consider extending their investment in packaging equipment and consider packing products other than meat and fresh produce.

For some operators of large stores own brand activity is minimal and intentions expressed are that this policy will remain. Own brands mean that store personnel must be responsible for merchandising and display activities. Two factors contribute to the impracticality of this. First with virtually all deliveries being made direct (some have 100% direct) manufacturers are anxious to be allowed to influence P.O.S. displays etc., and second the high volume low margin pricing policies do not allow for staff surpluses. Therefore, like the European trend, some large store operators find it more profitable to rely on manufacturers "total" promotions of their own products. This trend is most noticeable in the discount operations.

Some manufacturers have reacted to this by dropping national promotions and concentrating on developing promotions for individual retail outlets. An extension of this appears likely as more large outlets become operational. The principle appears one in which many vested interests can be compromised with optimum effectiveness.

One problem facing manufacturers is the reduction in system productivity caused by proliferating numbers and container types of own brand lines. Some consider that eventually price incentives may need to be offered to retailers for product size and pack shape rationalization, although with the current retailer emphasis on size image building it must be assumed that their demand for variation will not be a short run phenomena.

One solution possible is the extension of a third party service now offered on canned products by a distribution service. This service currently offers a 2 week delivery on imported products. It has the advantage of using its own buffer stocks and can label (and shrink wrap if required) and deliver in the two week period, which compares extremely favourably with the 6/8 weeks lead times usually worked on. The distribution can be direct or indirect.

The logistics implications of own brand sales developments are not clear. If the situation does not change and brands continued to expand, total system costs would increase for manufacturers and retailers. The manufacturers would be facing increasing system productivity problems, particularly in warehousing and handling and may find the problems compounded by an increasing demand for brands deliveries as volumes became large enough. Retailers would find that in store handling, storing and merchandising costs would narrow the price differentials even further, thereby reducing price and image benefits.

However, it is more likely that product ranges and variety will be rationalized thereby enabling both manufacturers and retailers to benefit from at least a levelling of costs.

The move towards developing tailored promotions for specific retail chains is likely to increase physical distribution costs. First of all administration is likely to increase. Service levels, delivery frequencies are also likely to increase but if these increases result in a lowering of total system costs, then manufacturers (and retailers) profits will be enhanced.

The development of own brand service activities by third parties is interesting. Apart from the example given there are small operators offering services in other product areas to small retailing concerns. The cost advantages are clear but so are the problems. Consolidation is one problem, short "production runs" another. It is clear then that the service will need to be developed alongside some other distribution function and that the contractor will only be competitive if he can develop both production techniques and sales volume to lower unit cost levels. This together with the capacity to offer delivery consolidation and field stocks in strategic locations are essential for success.

Non foods in Grocery Retailing

There is no doubt that the non-food content of grocery retailers turn-over will increase. The Delphi forecast indicates:

	Percent of T/O in Non-Foods	
	1980	1990
Multiples	10	20
Coops	15	15
Symbol Independents	5	5
Independents	3	5

Current activities suggest that a wide range of non-foods are likely to become permanent features. Apart from clothing, household equipment,durables, motor accessories, to name but a few, garden centres and other increasing leisure products are likely to be added.

Manufacturers generally are not directly involved in this growth. There are some who have diversified and operate franchises as separate operations but very few are involved in supplying non-food products in addition to their established grocery product items. For most this would involve developing buying and merchandising techniques and expertise which they consider are best left to other "experts".

Hence it follows that the non-foods developments will be left to the large multiples and to cash and carry operators who will service the independents.

The Development of Retail Market Shares

The Delphi exercise forecast market share developments at the retail level. These were:

	Percent	
	1980	1990
Multiples	50	58
Coops	15	13
Symbol Independents	20	19
Independents	15	10

It is interesting to consider views on how these will develop.

The recent past suggests that retail market share gains have been accompanied by competitive activity for an almost static overall volume. Hence, the multiples gains have come from the independents. Any further increases in the market share of food products is likely to be obtained in a similar manner. Total turnover can and will be increased by adding non-foods. But for grocery products and food generally both manufacturers and retailers will face a virtually static market.

Thus the multiples are likely to obtain their expected share increase at some other groups expense and the forecast suggests this to be a gain at the expense of the Coops, Symbols and the Independents.

To do this a number of changes can be expected:

1. In the first instance it has been suggested that one or two of the multiples will develop non-foods to the extent that they become "multiple department" stores and that the emphasis on food retailing will switch to non-foods. At the same time others will remain as large food multiples..

2. Some rationalization of the smaller, regional multiples is likely. They may merge with the larger groups, with departmental groups, or with other regional multiples in order to obtain synergic benefits (primarily in purchasing)

3. Competition for sites is likely to increase with the demand forcing up rentals and causing the smaller multiples to consider secondary and even tertiary sites.

The overall effect of each of these aspects is for the multiples to become larger and stronger in terms of purchasing power and competitiveness. Nielsen estimates that in 1972 167 multiple head offices accounted for £1972 million (45% of a total £4382 million). Of that possibly more than £1 million was accounted for by Allied Suppliers, International Stores, Sainsbury, Tesco and Fine Fare. Thus in 1972 over 20% of the total grocery business was in the hands of five companies. This situation is not likely to alter very much with the passage of time.

The Coop have excellent plans for regional CWS distribution centres servicing 50 regional retail societies. However, there are at present some 244 societies compared with 700 in 1967 but during the last twelve months the number has decreased by only 13. In addition total sales remained static around £1100 million between 1966 and 1971 despite a 37% rise to £15,229 million in the value of overall retail sales in Britain during the same period.

Experience so far with the regional distribution centres has not been good. Expressed opinion suggests that while the principle is a good one the executive operation is clearly not and that the problems need to be resolved which seem to be, either stores ordering from the distribution centres, or the order processing in the centres. But it must be viewed in context with the overall situation. The volume of Coop food business passing through the centres is small, probably 2½ - 3%. Future success would, therefore, appear to depend upon the C.W.S. satisfying existing retail societies that the service and cost centre arrangements are able to meet their demands.

The symbol independents have lost a point or so in market share. However, this obscures the fact that the three layout groups have increased their turnover while the remainder have lost sales. The nett effect has been an indicated overall decline in performance.

The future for the symbol group depends upon their being able to attract the suburban shopper who shops every day or every other day and who lives within 10 minutes of a symbol outlet. The symbols suggest that the high street grocer will be forced to move as site rentals increase and that even if rentals do plateau they will be at such a level that the gross margins from food sales will not be adequate.

They further suggest that the out of town movement will be restricted by:

Local authority reaction to protect income from rates.
Geographical constraints making sites difficult to obtain.
Many families retaining established shopping habits

These factors, they consider, will ensure a profitable livelihood for their members.

Future developments are likely to take two patterns. Firstly, mergers between wholesalers are likely to continue and will make for larger more effective units (eventually). Secondly the tendency for the average size of stores will increase, due mostly to store rationalization through economics of operating and to successful symbol members expanding their premises. Membership expansion is likely to be due to increases in numbers from independents and small multiple groups.

Other changes suggested are long run. For example, it would be logical for the overall philosophy to be changed. If a complete logistics approach were to be taken, all negotiating supply and control could be centralized. The wholesaler and retailer members could then divert their own time previously used on these activities to sales and marketing. The effect would then be for the symbol groups to become multiples.

One other long term possibility is the acquisition of retail outlets by their wholesaler service units. This vertical integration is again logical because it would enable the wholesalers more rigidly to control retail sales activities by product range and product pack variety rationalization, thereby making for greater shelf profitability, lower inventory levels and better volume discounts.

The logistics implications of changes in market shares are very closely connected to the size and location implications, which are discussed below. Thus at this stage, the changes in size and operating philosophy only will be dealt with.

Merger and acquisition activities among the multiples would result in standardization of service requirements and operational procedures. Thus even though the manufacturers would be faced with greater buying power their overall operating costs could be expected to decline as ordering procedures became standard and delivery policies were rationalized. Delivery points would likely as not reduce in number as the larger units rationalized outlets. However, frequency could increase.

Inventory management throughout the system would improve as the larger units utilize more sophisticated E.D.P. inventory control systems. These in turn would together with more control of store product ranges, tend to lower the inventory at retailer level but because sales would remain the same, manufacturers could expect to carry slightly higher stock levels to meet higher service levels.

Unitization problems should be reduced as policies are standardized. There should be scope for cost savings throughout the entire process.

Changes in the Coop are likely to be slower due to the fact that decisions are based on cooperation not coercion. The idealogical "National Coop" with one buying point, operating national promotion programmes, and effecting goods movements through regional distribution centres is a long way off. It has been suggested that this may never materialize. Rather the regional retail societies will eventually rationalize themselves and these will operate a central warehouse system planned to meet regional rather than national requirements.

This would be welcomed by manufacturers, who could not fail to operate more economically. In effect it would mean that some 15% of their business (assuming no changes until 1990) would be going to 50 central locations. Although physical distribution costs may be reduced there are obvious marketing and sales implications which would require resolving.

The symbol groups' developments also suggest system rationalization. The degree of rationalization (and thus cost saving) depending upon how far the projected developments reach.

If, as has been suggested, the smaller groups join the larger simply to obtain buying power but do not integrate beyond this, the manufacturers will in fact be facing profit decreases, for they will be providing the same service to the same number of outlets but will not be able to rationalize service requirements. Hence delivery and unitization problems will certainly not ease (they could deteriorate)

However, this is unlikely. Any symbol group merger is likely to be accompanied by acquisitions or mergers of wholesaler members and therefore effects on manufacturers distribution systems similar to those expected from mergers of multiples could be expected.

The long term developments would operate to favour manufacturers systems' operations. More organization at retail and wholesale levels would enable full use to be made of the sophisticated systems being developed by some symbol groups. For example, sales forecasting would be possible at retail branch level which would reflect itself as an efficiency throughout the system by reducing inventory levels and lead times. Delivery operations could also be improved by better vehicle utilization with larger loads.

The Variety Chains

The forecast increase in food sales will increase 20% by 1980 and 40% by 1990 relative to 1970.

In terms of grocery products the variety chains are not particularly significant as far as proportion of total volume is concerned. It has been estimated that Woolworth, British Home Stores, and Littlewoods account for some 2/3% of the total. Therefore, it can be seen that they do not, and will not, account for very much of the total business done. Using the forecast increases the 1980 value will be some 2.5/3.5% of the total and by 1990 2.8/4.2%. Clearly this will not affect the future of physical distribution. Even when the Marks and Spencer food sales are added (£127 million approximately for 1972) the total would double but this is all own brand products and contains a great proportion of fresh produce and meat and cannot all be considered as grocery products in terms of the Nielsen audit.

Clearly the variety chains do not add to the city centre distribution problems, as far as grocery products are concerned. In each case depot delivery systems service the large majority of each store groups needs and therefore any restrictions imposed on deliveries are not likely to cause them problems. Neither the volumes involved nor the delivery services required are likely to agravate the congestion problems.

It can be expected that the variety chains (and the departmental stores' food halls) will follow the Marks and Spencer lead into high margin lines. This can be done in two ways. They can concentrate on quality and therefore higher prices or they may tend to specialize by offering delicatessen type merchandise, again higher priced. This move will be necessary to justify using selling area for this type of food product. The average margins simply will not cover conventional food/grocery sales and will show a relative loss situation when compared with other items sold.

In addition to this there is the car parking problem which is worsening in the city centres and is making bulk grocery shopping in these areas virtually impossible.

Thus together the gross margin/high rents and car parking problems will dictate product ranges in these outlets. Products will be speciality and/or "topping up" types only.

The logistics implications of the variety chains food sales increases are not significant. What is significant is the psychological effect their expressed intentions to stay in the city centres are likely to have on other food and grocery retailers.

Those outlets, dealing in similar speciality items or whose locations are adjacent to offices or other similar places of work, who can structure their costs around low average sales per sales visit (either because of, high margins, small space and low rent, or, low labour costs) are the only type of store likely to survive and to require service. Clearly their drop sizes will be small in most instances and are likely to be serviced by a consolidated service or cash and carry. This problem is expanded next in the discussion on size and location problems.

Changes in Store Location and Size

The major growth areas in the Delphi forecast were:

Supermarkets in out of town locations
Superstores in out of town locations
Supermarkets in suburban areas.

For other areas modest growth or no growth at all was forecast:

Supermarkets in central shopping areas
Superettes in central shopping areas
Superettes in suburban areas

The forecast growth of store sizes suggests that up to 1980 the largest growth rate will be in stores of the 15000 - 24999 sq.ft. size category followed by stores of 25000 sq. ft. and over. The position reversed by 1990.

Medium sized store growth is more modest, but nevertheless steady i.e., stores in the 8000 - 14999 sq.ft. size category are expected to increase by 15% in each decade and the 4000 - 7999 sq. ft. group by 10% in each decade.

Smaller stores can be expected to decline. The 2000 - 3999 group will remain static until 1980 and then decline 10% by 1990. Those less than 2000 sq. ft. can expect to decline by 15% by 1980 and a further 5% by 1990.

Clearly since 1971 the situation has changed and I.C.D. was reporting on those developments reported to them. However, this matrix suggests that it is unreasonable to expect a change of attitudes by local authority planners and a switch of emphasis by store developers to occur in a short space of time.

Therefore the fact that almost all developments took place in the high street 52%; precincts 32% and; peripheral locations 11%, together with the Delphi forecasts, would suggest no dramatic changes in size and location factors by 1980 with out of town and edge of town developments taking place at a faster rate during the 1980 - 1990 period.

Therefore, it is clear that city centre supermarkets are going to be an important part of grocery retailing for sometime. At the same time the development of pedestrianized shopping areas. will continue as these offer some relief to traffic congestion problems. A number of opinions expressed suggests that if private cars can be encouraged (or prohibited) from the city centres and thereby allowing access for public transport and delivery vehicles many problems will be resolved but that these will be temporary solutions and that eventually food retailing will have to move into peripheral and out of town locations, thereby leaving the city centres for durables, clothing etc., where comparison shopping is a major feature.

It would appear then that the estimates made of stores of 20000 sq. ft. and above, i.e., 140 by 1980 and 240 by 1990 is in fact approaching a reasonable estimate. Currently I.C.D. estimate 100 stores in this category. Because of the lack of reliable information, acurate predictions are not possible.

Thus the major types of stores to be serviced over the period will be:

In city centre locations;

1. High street supermarkets of medium to large sizes (4000 - 15000 sq.ft.)

In peripheral locations (edge of town, and suburban)

2. supermarkets (15000 - 2500 sq.ft)
3. superstores (50000sq.ft. and over)
4. convenience stores (up to 2000 sq.ft.)

In out of town locations;

5. superstores (50000 sq.ft. and over)

These six types account for the major types of retail unit which will require physical distribution service during the period. Each is now discussed in terms of its operations and the service required, and the problems involved in providing the service. Because many of the issues which affect distribution to each type of outlet, and the fact that policy varies between companies for a number of reasons, a detailed discussion of the problems of direct/indirect deliveries is deferred.

Medium sized high street supermarkets (4000 - 8000 sq.ft)

There are two basic problems facing this type of outlet:

Space
Access

Space: An operation of this size needs to carry inventory and the average inventory coverage is two/three weeks. The continuously increasing product ranges will undoubtedly cause this period to be decreased as pressure for space for both storage and selling area steadily increases.

One solution to this problem is to restrict the product range sold through the outlet. Thus line and variety rationalization (discussed earlier) are likely. Another solution is to introduce inventory control methods which will reduce the order cycle/ replenishment time. This requires:

1. Large E.D.P. capital investment
2. A high degree of control based on an extremely reliable information system
3. Frequent and controlled deliveries

Access: Two aspects of accessibility are important.

1. Locational access - in terms of the actual site of the store, parking restrictions, delivery restrictions etc.

2. Physical access - the ease (or otherwise) with which a delivery can be effected. Thus the ease with which vehicles can approach the unloading area, and with which handling equipment can be used is important in terms of operational costs.

Problems arise because of:

1. Frequent, continual deliveries from a number of sources
2. The drop volume being small prevents effective unitization
3. Imposed restrictions in terms of vehicle access

Solutions to these problems include:

1. Consolidated deliveries
2. Out of hours deliveries

The logistics implications of the continuing presence of these types of outlet are all related to financial problems.

In the first instance the increasing site rents and labour rates will force management to look for economies.

Thus line rationalization together with an overall lowering of inventory holding is likely. This will make higher service levels essential and increased delivery frequencies necessary. In turn this will raise the costs of supply (be the outlet supplied from a retailers central location or direct from manufacturers).

Access and handling problems (which includes checking orders) can be eased together with a reduction of delivery turn round times by using roll pallets. These are in use now but present some problems, but once resolved, could be expected to be used more widely. Thus although there is capital cost involved, time and cost savings are available for future operations.

Consolidation services would obviate a number of problems. The number of delivery vehicles will be reduced; drop sizes can be increased and handling aids and unitization methods can be applied at proportionally lower costs. It is difficult to see how this service cannot increase with this particular outlet type and the problems involved. The stockholding service of these companies can be utilized to improve store in stock positions.

Out of hours deliveries are not likely to solve many problems. There are a large number of this type of outlet and with the small drop size involved the costs (at overtime rates) are likely to prove prohibitive throughout the system.

The V.I.P. system discussed earlier is a possible solution but it has a major problem because it is not a stockholding system. Thus if an order is late in arriving at the V.I.P. the store to be serviced will not receive its order and because;

deliveries are not daily, and;
its stock coverage is likely to be progressively reduced;

It is likely that the incidence of stockouts will be high because even if delivery frequencies are increased they still may not be able to prevent this.

It is quite clear that this type and size of operation cannot (in general terms) survive. Not only will in-store costs increase to a point where it can no longer remain viable but the costs of physical distribution service will not be justified by their return. The use of a consolidation service can extend its life span but this cannot be for very long.

Large, high street, supermarkets

This group of outlets has similar problems to the medium sized units.

In some aspects the problems are worse because an increased sales volume requires a larger service area, more frequent and larger volume deliveries. In each instance it results in higher costs for service.

It has been estimated that by using a 33 roll pallet capacity vehicle as opposed to an 18 roll pallet vehicle, an annual saving in the region of £15000 is possible. Thus for the large city centre supermarket with limited vehicle access, size can be a problem.

The pressures on selling space are just as real. A large store must offer customers a wider product range than its smaller competitors. As product ranges increase in future the situation and effects on the total distribution system can only get worse.

Delivery frequency is higher with larger stores, and for some daily deliveries are required. Thus again access problems intensify over time.

Likely solutions to future logistics problems are not too dissimilar to those for the smaller stores.

Brand rationalization will enable larger unitized orders to be delivered. This will reduce handling and storage problems and lower system inventory. This will require accurate and reliable management information. One problem common to both types of supermarket is branch sales forecasts, clearly an early solution of this problem would give more control in this problem area.

Brand rationalization will not solve all problems. There will remain many small orders and for these a form of consolidation will eliminate many more problems. In the case of larger supermarkets order sizes will be of a size sufficient to enable pallets or roll pallets (depending upon rear access for vehicles) to be used. Thus the consolidation services can expect to be used to a larger extent to service the city centre outlet.

Out of hours deliveries together with an expansion of out of hours shelf replenishment is likely to be another development. The larger city centre stores would offer many manufacturers (or retailers own delivery systems) sufficiently large drops to make this operation viable. However, because of the problems likely to be met, and the opposition likely to out of hours deliveries, other means to relieve access problems are likely. The most likely developments (and the least costly for local authorities) are pedestrianization schemes for city centres. These can (and do) work provided that planners accept the need to provide delivery vehicle access.

Supermarkets in peripheral locations (edge of town)

Because peripheral location rents are lower than those in the city centres, the supermarkets in these areas may view the selling/storage space problems differently.

A wider product range can be offered and store inventory holding will need to be larger to prevent stock outs. Alternatively a larger central stock or increased delivery frequency will be required. Retailer policies vary and are influenced by financial situations.

These larger units make unitization economies possible for large volume, fast moving items. It is logical to minimize handling between the production line and the point of purchase. And at this scale of operation a continued handling/merchandising approach is possible.

The ideal is for a mobile merchandizing unit to be filled at the end of a production line with price marked products and to move through the system to be placed on the sales floor with very little value added other than time and place utility. There are problems to be solved.

First is the ownership of the mobile unit. In France the hypermarket operators supply manufacturers with collapsible units which when expanded can contain a 17 to 44 cu. ft. load. The manufacturer is given the unit together with a pricing/loading/delivery schedule. After pricing the items at the factory they are loaded into the unit, fork lifted on to the transport and delivered direct to the sales floor.

This leads into the second problem. Many manufacturers could not offer this service at an economic rate. Moreover in the size of retail unit being discussed here (15000 - 25000 sq.ft.) the products for which the service could be utilized would be few.

To solve the manufacturers' problem a service is already offered by an independent distributor whereby items are delivered on pallets to the distributor's depot. They break bulk, price and pack into merchandizer units. The units are then delivered to the retail stores. This service should attract retailers because pricing can be changed at short notice, thus giving flexibility.

against profit from sales. As trade terms become oriented towards distribution economics, it is likely that superstore operators will re-appraise this situation. Indeed the new Asda store at Wrexham may well indicate the future here. The use of mechanized racking has enabled warehousing space to be reduced by one third of the normal requirements for a store of 50000 sq. ft.

Unitization economies are likely to be developed with an extension of the mobile merchandiser unit described above, but larger. The principle is likely to be extended to some medium and slow moving products using dividers to provide compartments. Not only do these units save handling costs, they increase space utilization and will be able to be used as shelf replenishment vehicles in the store.

Delivery patterns likely to emerge are based on an appointments system. This enables a faster turnround of what are usually large vehicles. Vehicle access in terms of store location and goods reception are being considered during the design stage of these outlets. The Dykes legislation may cause problems in terms of vehicle queues because of the vehicle size restrictions likely.

The effects on manufacturers distribution systems are initially likely to cause some cost increases. This is so in the unitization area as the manufacturers seek and find cost effective alternatives to provide the type of service to be provided.

Inventory costs may increase not because of any particular increase in service level requirements but because the specific unitization requirements will mean that manufacturers will need to retain more stock in their own facilities for longer periods while unit loads are prepared.

Delivery economics should improve as loads get larger but the Dykes Bill, when operational, may negate the gains from volume unit loads and improved vehicle utilization and scheduling.

Convenience stores in peripheral locations

The convenience store movement has been promoted by the symbol groups which over the course of time may be expected to decrease in number. This is likely to result in there being three or so symbol groups eventually.

The primary sources of supply are the group members' wholesaler and cash and carry outlets.

Assuming that numbers of symbol groups decrease and that the earlier proposals made concerning organisational developments do in fact materialize, there remains to be considered the effects of size and location.

Because of the supply sources the manufacturers are not particularly concerned with the problems of access and small loads because the wholesalers are delivering consolidated loads to retailer members.

However, this does not mean to say that the wholesalers themselves will not face problems. The main problem area is likely to be traffic restrictions. In many areas restrictions are increasing and for these outlets in urban locations (and the problems facing urban and suburban retail outlets are similar enough for them to be considered together) the possibility of out of hours deliveries or consolidated deliveries is a real one.

Out of hours deliveries would present no real problems. Already some wholesalers service their retailers in this way. A sealed roll pallet is left in a secure place overnight by the wholesaler's driver, who collects empty containers at the same time. Thus the principle is in use and can be expanded. It works well because of cooperation and trust.

Consolidated deliveries do not pose any threat. The wholesalers have well organized delivery programmes. Vehicle utilization is high and so is vehicle cube utilization. It would, therefore, be quite possible for deliveries to be synchronized into an area scheme.

There are other retailing units likely to appear during the forecast period. The hypermarket has been considered as a superstore in the previous paragraphs and the convenience store in the city centre has been dealt with the suburban convenience stores because the majority are located in secondary or tertiary locations and thus their problems are similar.

The regional shopping centres will contain large supermarkets. For all intents and purposes these can be considered as suburban supermarkets for physical distribution servicing.

Cash and Carry Developments

The Delphi forecast of cash and carry grocery business suggests an eventual plateau by 1990, with some major changes in customer and product type.

By 1980 the cash and carry share of the grocery trade will have increased from 13/14% in 1970 to 18%, but by 1990 this will fall slightly to 17%.

In 1970 40% of customers were grocers and general stores. These will account for 35% in 1980 and 30% by 1990. Caterers will increase from 40% to 45% by 1980 and 48% in 1990. Confectioners, newsagents and tobacconists are expected to remain constant at the 1970 level of 10%. Greengrocers, butchers and non-food retailers will increase from 10% in 1970 to 12% in 1980 and 13% in 1990.

Within the range of products offered groceries will decline from the 1970 value of 63% to 55% by 1980 and 48% by 1990. Wines will increase from 10% to 12%, 1980 and 15% 1990. Confectionery will remain static with a 10% share of total business. Tobacco sales will decline from 8% to 7%, 1980 and 6% by 1990. Meat and fresh products can be expected to increase from a 1970 level of 2% to 4% in 1980 and 6% in 1990. Non-foods will increase from 7% in 1970 to 10% in 1980 and 12% in 1990.

The changes forecast are compatible with recent overall growth trends. Grocery and food products have a slower growth rate than other product groups, thus it is likely that the grocery volume will increase but that other product groups will replace groceries as a leading line. At the same time cash and carry operators are seeking new higher margin lines actively.

One area some feel there is opportunity is in that of confectioners, tobacconists and newsagents as future service from their specialist wholesalers declines. The other areas include meat and fresh produce in packages designed to meet butchers, caterers and retailers.

After a period of rapid growth cash and carry is undergoing some changes, changes which will affect their physical distribution service requirements.

First, is the rationalization in unit sizes. In general the units are getting larger and new depots are opening in the 25000 - 50000 sq.ft. category. With the increase in size so there is a shift in emphasis in the product ranges. The smaller units, less than 10000 sq. ft. specialize in grocery sales and as size increases so does the product range offered. For example, around 20000 sq. ft. tobacco, wines and spirits, catering and butchery products are added. The larger units offer delicatessan products and an ever increasing range of non-foods.

Size has its problems and many large units have found that customers pay regular but infrequent visits for specific items (usually non-foods) and use smaller, local and more convenient depots for staple goods. Many cash and carry users have found that time spent on price comparison is not worthwhile.

Another development likely is specialization. Many cash and carry operators cannot compete with the very large operations. Thus they are beginning to specialize. There is a problem of "width and depth". Width implies product range coverage and depth implies variety within product groups. It was suggested that to do both well the size required is some 150000 sq. ft. To offer a general range some 40000 sq.ft. The answer for many operators is to specialize (i.e. concentrate on depth) and to leave special items to the large depots. If this continues it is likely that groceries, catering and the growth areas of fresh products (meat and fruit and vegetables) may well become concentrated in depots specializing in these areas.

The anticipated increase in catering specialization would seem to be confirmed by the Delphi forecast of growth in consumer expenditure in restaurants and take home outlets.

This specialist development would have implications for manufacturers, particularly for their logistics operations.

It has been suggested that generally cash and carry operators' handling and control methods are not particularly efficient. For some no E.D.P. facilities exist and stock control, based on a 2/3 week cover, is poor. Handling is often not good and pallet loads may well be broken down before unloading from a vehicle because facilities to lift and move a full pallet load do not exist.

The introduction of V.A.T. has forced some order into the cash and carry operators 'administration. Invoices are required to enable claims to be made. Further sophistication will follow.

As specialization and sophistication progresses, changes can be be expected.

Better inventory control may mean lower stocks in the depots and in manufacturers' warehouses. It will also mean more control and offer both manufacturer and cash and carry operator an opportunity to forecast sales and production. This would release cash for investment in widening their product ranges.

Development in the area of deliveries is likely. Many depots are on industrial estates which are cramped and present access problems to delivery vehicles. Wider use of the appointments system will reduce waiting time. Specialization will enable the operators to install more appropriate handling equipment. Out of hours deliveries would be acceptable because depots are open until 8 p.m. or 9.p.m.

The development of specialization within cash and carry will aid the small size manufacturer.

Often the small manufacturer is also a specialist and can never therefore, hope to ship his products in volume to retail outlets unless it is to a centrally located warehouse. Cash and carry can act as a vital link reducing the manufacturers contribution cost by enabling him to ship in bulk into their depots. Much the same argument can be made for the slow moving products of larger manufacturers.

Unitization is an area where change is likely (and necessary). Much could be done to improve the shrinkage problems inherent in this type of operation. For example, shrink wrap could be used more widely for not only would security be improved but identification problems would also be reduced (often 30% of items marked out of stock on stock lists are actually available when packs are examined).

From these projections it would seem that the current trend in larger families (i.e., five, six and seven persons) will be maintained but that some increase can be expected in one and two person households.

Long term regional population shifts suggest the following regional growth rates for (1969 - 2001):

East Anglia	35 - 40%
East Midlands	30 - 35%
South West	25 - 30%
South East)	20 - 25%
West Midlands)	
North West	15 - 20%
Wales)	
Yorks & Humber)	10 - 15%
Scotland)	
Northern	0 - 10%

The importance of regional growth rates is not as large as the population shifts within regions. No projections have been made for these but the implication of past movements is that population migration has been intra-regional, not inter-regional. Thus the projected regional growth rates become less important because they are based on growth from small bases (e.g. East Anglia, 30 million people, 1.7% of total population: East Midlands, 6.1 million people, 3.4% of total population). (8)

A review of population shifts in the major urban areas indicates large decreases but when regional changes are examined there is no indication of volume movements thus it can be concluded that population shift has been mostly from urban areas into suburban areas <u>within the regions</u>. The conclusion to be drawn then is that population movement is tending to make the British suburban dwellers and likely, therefore, to support and benefit from peripheral, edge of town shopping developments.(8).

Projections of the working population structure for 1976, 1981 and 1991 suggests that the current trend for more married women to join the labour force will continue. By 1986 this proportion of the work force will increase from 41.1% to 47.5%.

Household ownership rates of all durable items was estimated to increase in the Delphi forecast. Washing machines will increase from 64% in 1970 to 75. in 1980 and 80% in 1990. Refrigerator ownership will continue to increase; from a 1970 proportion of 63% of households to 75% in 1980 and 85% by 1990. The rapid growth in home freezers has been discussed previously. Food and drink mixers will increase from 24% in 1970 to 35% in 1980 and 50% by 1990. Dishwashers are expected to increase from 1% in 1970 to 5% in 1980 and 15% in 1990. Car ownership is expected to show steady increase. Families with one car will increase from 45% to 58. by 1980 and 68% in 1990. An additional 6% of families had an extra car in 1970. This will increase to 10% in 1980 and 20% in 1990. Telephone ownership increases are expected to reach 45% in 1980 and 65% in 1990.

Shopping habits are expected to change during the forecast period. In 1970 some 23% of housewives shopped daily. By 1980 this will be 19% and by 1990 14%. Those shopping every 2/3 days/week, 38% in 1970, will be 34% by 1980 and 30% by 1990. No change in the 11% shopping every 4/5 days/week is expected. Once a week shopping is to increase, in 1970 25% of housewives shopped once per week by 1980 this will increase to 31% and by 1990, 37%. Those shopping less often, 3% in 1970, will be 5% by 1980 and 8% in 1990.

Consumers will spend more on "eating out". It is forecast that restaurant expenditure will increase by 25% by 1980 and 70% by 1990. The increase in "take home outlets" will be larger, 45% by 1980 and 80% by 1990.

There are logistics implications in consumer changes. The long term trends in population change indicate no rapid changes in established trends. This would suggest that product development and any specific physical distribution aspect connected with product development and subsequent marketing policy will not face any unforseen sudden demands.

The long term trends in family unit sizes again suggest no dramatic change. It is clear that if the trends do continue then the continued demand for larger pack sizes will continue for convenience and economy reasons.

Regional population trends will require monitoring. Although the regional growth patterns that have been predicted will not have general implications for facilities location policies, it is possible that a manufacturer whose sales demand contains regional variations may find the need to plan for increased facilities in an area.

The intra-regional movements will have an influence on retailers' warehouse and store location policy. Bearing in mind that the evidence suggests this to be the most important aspect of population movement a detailed study of past, current and projected trends is made before making location decisions.

Married housewives will be an increasing proportion of the retailers' and the manufacturers' customers. This factor together with a decrease in shopping visits will make it necessary that retail stock outs are avoided. Thus service levels are likely to be higher involving more inventory in the entire system. This in turn will influence inventory control and E.D.P. systems generally in an attempt to develop accurate forecasting and control programmes.

Merchandising will need to be more cost-effective. If housewives are shopping less frequently it will be essential that no opportunity be lost of making sales. Thus it is necessary for manufacturers and retailers to cooperate to develop programmes and equipment which will achieve sales level targets under the circumstances of fewer exposure opportunities. The unitization developments discussed earlier are required to do this effectively.

The move to a leisure oriented society will emphasize the need for easier quicker shopping. The increase in convenience food sales discussed earlier is supported by an increase in holidays and decreases in working hours. It is likely then that this mood will favour the development of large efficient shopping units and ensure the continuing livelihood for conveniently located smaller stores for items forgotten or "topping up" requirements. The logistics implications of these have been discussed.

The forecast changes in durables ownership underwrites the likely demand and behaviour patterns discussed. For example more cars can only mean that more cars will be used for shopping and these will require parking facilities. Carrying capacity will be increased and the effort required decreased. Hence less frequent shopping, buying larger amounts in bigger packs follows logically.

Refrigerator ownership, which is to increase, will guarantee growth for frozen foods while the increase in food mixers will broaden the appeal of some other products, hitherto slow moving items.

While shopping frequency is expected to become less, many opinions consider that Friday and Saturday will continue to account for the bulk of the shopping volume. Evidence for this is drawn from experience with stamp incentives. Despite offers of "double stamps" for midweek shopping, there has been no appreciable move. This suggests that more retailers will consider closing their stores on Mondays for replenishment and

merchandizing activities. There is also a likelihood of hours being modified. Later opening would be accompanied by later closing. This would help with replenishment problems and delivery vehicle scheduling. Currently some stores plan early morning deliveries, by opening later some flexibility would be added and utilization of vehicles, drivers and warehouse staff may be improved.

PHYSICAL DISTRIBUTION SYSTEM PLANNING - FUTURE CONSIDERATIONS - RETAILERS

The central problem for retail distribution system planning concerns direct and indirect deliveries. The essence of the problem is the cost involved in ensuring that in-store service levels are achieved and maintained.

Although the available alternatives are numerous, the multiple grocery retailer can narrow these by considering using a depot system. In past years this has been a popular solution to the stock coverage problem. It enabled larger discounts to be obtained; lower overall inventory holdings; much tighter control of branch buying; increased labour productivity in both stores and warehouses. Because of different policies no standard approach to the use of depots has been observed. The following list, by no means exhaustive and in many instances inter-related, itemizes just a few of the factors influencing retail distribution system design:

1. Number of branches
2. Age of branches
3. Location of branches
4. Size of branches.
5. Density of location of branches
6. Growth pattern
7. Product range and characteristics
8. Inventory control policy and method
9. Branch management policy
10. Financial structure
11. Trade terms

In the last year an increasing trend for direct deliveries has been developing and this raises the question of its likely persistance. Some of the reasons for an increase in direct deliveries are again specific to many companies but general reasons appear to be:

1. Operating capacities are at or approaching maximum economic levels
2. Warehouse staff are expensive to recruit and in any event are difficult to find in many areas.

3. Transport drivers are becoming highly paid and therefore costs are high
4. Transport regulations will force up costs because of administration and more importantly, E.E.C. transport legislation will shorten hours and therefore increase costs.
5. Land and building costs have risen rapidly during the past two years, causing retail management to reconsider extension and new building plans
6. The trade terms given for central warehouse deliveries do not offer sufficient incentive to expand (or add new) warehousing facilities.
7. Because of (6) increasing sales volumes for many products has qualified them for the same discount regardless of delivery parts
8. The merchandising activity of manufacturers' salesmen has had mutual benefits

Against this background it is useful to consider possible development trends.

Generally a branch supermarket will hold some 2/3 weeks stock and although aiming to achieve a 100% service level, averages 96-98% or so. This stockholding can be decreased and the service level increased in one of a number of ways:

1. Holding stock in central location
2. Increasing delivery frequencies
3. Reducing the replenishment order cycle by a combination of (1) and (2) and a computerised stock control system

Until recently this appeared the basis for operating. Exceptions appeared due to product characteristics, e.g. bulk fast moving items, short shelf lives, low weight/high bulk items etc., were sent direct to branches. On the other hand large manufacturers with multi-product ranges and multi-plant manufacturing found it advantageous to both parties by delivering direct to branches.

The current trend in direct deliveries is thought by some to be cyclical. It is suggested that because investment in fixed assets, such as warehouses, is a "step function" combined with the business pessimism which was prevalent during 1970/1/2, decisions to extend existing warehouses or build new ones has been delayed. During the same period land and building costs rose rapidly such that now the advantages of direct or indirect deliveries, are currently greater for direct deliveries.

However, trading and environmental forces would seem to be developing such that a reverse of policy may occur.

The product changes likely to occur are one factor. An increasing product range will require more rationalization and tighter inventory control to achieve stock turn rate targets, more control can be exercised with centralized inventory holding. The decreasing price margins of own brand products could have a number of influences. Manufacturers may raise order quantity level to achieve economic production runs, if this occurs a storage problem is created. Many manufacturers have already noticed a decrease in warehouse utilization because of own brands, they are unlikely to want to intensify the problem. An increasing involvement by retailers in pre-packaged meat and other fresh foods and, therefore, the need to be able to exercise quality control over the product during distribution is another factor making for a likely return to centralized stock holding. It could be argued that as the overall cube/weight ratio changes because products themselves are becoming lighter, thus increasing cube storage requirements, retailers would be less likely to invest in warehousing because the utilization would be low and in fact continually decreasing. However, this can be answered by considering the fact that average shipment weights from manufacturers are increasing. Therefore to continue to handle deliveries of many items direct into branches may well prove impractical because of the handling problems.

The future growth of the multiples will influence the direct/indirect decision. Whatever way the multiples achieve growth (be it organic or through mergers and/or acquisition) their number of branches will increase and as they increase so will their control problems. Computer applications are now, in terms of cost-effectiveness, quite inexpensive. Therefore the retailer is beginning to be put into a position of being able to exercise close control over a large number of outlets and the cost of the method of control is offset by the savings available from more efficient buying and stock control.

An example of how efficient computer methods have become is illustrated by the system used by one of the leading multiples. The system uses an electronic optical reader in each store. Each item has a coded card which is "read" daily when replenishment of the item is necessary, An on-line link to a central computer adjusts depot inventories, raises depot orders, etc. and enables the company to use a 14 hour order cycle and maintain a 96/97% service level. Stockholding is kept extremely low, approximately 1½days.

The extension into sales forecasting would enable manufacturers order cycles to be reduced from their average of 7/15 days which is necessary if direct delivery systems are going to be required. There are alternatives. One is for manufacturers to increase delivery frequencies, an expensive alternative and likely to prove unpopular (possibly illegal eventually) with city centres. The second is for the development of a universal product code which would enable electronic cash registers to generate data from which the following can be generated:

1. Sales record for customer
2. Sales record for store which would enable:
   a) sales by product, packsize, flavour etc., to be recorded
   b) store inventory records to be recorded and to be transmitted to a central computer

c) from (b) depot replenishment orders can be raised together with picking instructions etc.

d) also from (b) a link through to the suppliers ordering system would enable a replenishment order for depot stock to be raised together with shipping instructions

The variations are almost infinite. A depot is not necessary the computer can be programmed to by-pass the depot and order directly on a manufacturer. The problem of deliveries can be overcome by programming maximum and minimum order levels into the retailers computer memory so that E.O.Qs (economic ordering quantities) can be used. The manufacturers' computer memory can store orders and aggregate to obtain an economic drop. At the same time an emergency overide can be built into the programme to respond to imminent stock out situations.

The technology to do this is available but problems exist. Some of these problems are behavioural, e.g. the consumers acceptance of shelf edge marking and their confidence in the retailer in that the price on the shelf edge does correspond with a symbol on the pack. Another problem is that to introduce the system requires cooperation among manufacturers and retailers, many of whom may be unwilling to compromise. The introduction of a system of this kind would in fact solve many of the aspects of stock coverage and speed through checkouts problems.

The age of branches is an important factor. Many outlets belonging to the larger multiples are third and fourth generation. These branches are not designed to cope with the receiving and storing of volume shipments which are many times larger than the goods movements for which the store and its facilities were originally designed. A predominance of these stores in a group will influence the eventual decision into being one which is expedient in the short run,i.e. often small and frequent deliveries.

Branch location also influences the choice between direct and indirect deliveries. If branches are located in a small geographic area it makes an in-direct delivery system logical. The

retailer has maximum control, marginally better terms and low transport costs (a major cost centre).

Size and location of branches will be a major influence on this decision. As development of retailers takes place and more edge of town and out of town units with larger selling and storage space are built in areas with lower rentals and rates, the growth of direct deliveries must be expected because of the large drop sizes and the fact that because costs per square foot are not as high as they are in the city centres area, can be devoted to storage.

At the same time it must be recognised that for some foreseeable time ahead the bulk of food shopping will remain in the city centres. While some of these will be developed either to exclude all but delivery and transport vehicles or may simply provide bus and delivery vehicle lanes, many will not and therefore some form of delivery consolidation will be necessary. This will be provided by a contractor or through a retailer owned depot system.

Finally, financial structure and trade terms will have an increasing influence. Many retailers have recently invested in warehouse facilities. This has, after the recent inflation, left them with a high overhead situation. This in turn has dictated that maximum use be made of the facility to justify the investment and achieve return on investment targets.

Trade terms do not at present reflect the cost difference which exists between direct and indirect deliveries. It has been estimated that a manufacturer's costs for a branch delivery can be three times those to central warehouses. There is no doubt that manufacturers are beginning to resolve the conflict of interests between sales and distribution considerations and some are likely to offer trade terms which reflect distribution economies in the near future. Armed with this information retailers' planners would be better able to appraise the cost effectiveness of each alternative.

Clearly there can be no general optional solution. The current situation in which there are very few clear cut direct or indirect situations will also exist in the future. However, the general opinion expressed suggests that the trend to direct deliveries will increase. One manufacturer considered that currently direct deliveries represented 40% of the total. By 1980 this was estimated to increase to 65%, however, this was expected to be the maximum likely to be reached.

PHYSICAL DISTRIBUTION SYSTEM PLANNING - FUTURE CONSIDERATIONS - MANUFACTURERS

Like the retailers, manufacturers operate their systems at predetermined service levels to satisfy the service requirements of their customers.

However, because unlike the retailer whose system is (or should be) uniform in terms of numbers of drops and accessibility which are laid down as an operating policy, the manufacturer has a hetero-geneous set of customers. Thus the manufacturer must be aware of developments available to him with which he can either increase his overall effectiveness or can decrease costs.

The most appropriate way of discussing future considerations is in terms of the activity centres which have been defined previously. It will be remembered that these are considered to be:

Inventory Management
Warehousing and Materials Handling Facilities
Unitization
Transportation
Communications

In the discussion that follows it will be found that considerable overlap occurs. This is unavoidable. To these must be added Administration and Organization which is the overall coordinating effort.

Dealing with administration and organization first. There are two aspects to be considered: the long run and the short run.

In the long run, manufacturers must consider the elevation of the distribution function within company operations. This does not mean to suggest that every company should have a distribution director. Rather it means that distribution should play its part in overall corporate planning, which have been forecast and subsequently discussed in terms of their effects

on physical distribution, are fundamental to the company's operations. The forecast product changes may require large investment in the physical distribution system or, equally, may require complete flexibility in the future because of a forecast market decrease. Unless there is the availability of this expertise at senior level within manufacturing companies, many can anticipate some serious problems through lack of foresight and planning.

Another long run aspect is the total materials flow approach to business planning. In a dynamic economy business growth can often be achieved (at the rate desired) by acquisition. This often requires the company totally to reappraise its manufacturing policy, purchasing policy, financial structure, and marketing policy. Very often this is done as a series of isolated exercises whereby what is considered as the best ideas from one company are incorporated with those of the other. In almost all instances the new parent company "rationalizes" its new subsidiary within its own operations and potential synergy effects never considered.

A total materials flow would attempt to achieve an optional design for the new formation. Purchasing, production planning, marketing planning, and distribution planning would be considered in terms of their new inter-relationships before any major decisions are taken.

There has been a significant amount of merger activity in the food industry in recent years, but there has been no indication that managements have taken any approach other than a marginal one, when the new unit has been integrated. Estimates of this approach being in use towards 1980 seem well founded as the approach will be extremely useful not only in a merger situation but for the multi product company with numerous production units, servicing an industry with many outlets.

In the short run there are a number of organization changes likely. The most important is the control of the customer service activity by physical distribution management. This enables the complete administration of orders from receipt to delivery and minimizes causes for delay. Physical distribution management can initiate improvements to reduce the order cycle time and to eliminate queries.

This is particularly important when the developing structure of the grocery trade is considered. The emergence of large multiple groups has significant effects on a manufacturer's cash flows. Hence any means of reducing the period during which cash is owing can reduce costs. For example, an innovation introduced by one manufacturer whereby delivering queries were eliminated by post-invoicing based on complete and returned delivery notes, delayed invoices by 48 hrs, but considerably reduced the queries on invoices (previously based on computer raised orders) and thereby reduced the time over which accounts were outstanding.

For manufacturers the problems of inventory management are important ones. Many have developed sophisticated programmes for computer applications. Again the problems of increasing product ranges has made this essential and most consider it to be a factor for the future.

Future development which include of course communications, will undoubtedly include an attempt to link up manufacturer and retailer inventory systems. The electronic cash register (discussed earlier) offers this development but there are real problems. Apart from the universal product code problems there is a need to develop systems and programmes which are also "universal". This could prove unsurmountable because although there is no technical reason for not being able to link different types of computer, the basic input data must be the same if the apples and oranges situation is to be avoided.

Currently at least one retailing group is working on a system whereby a tape of its orders is supplied to manufacturers which is processed through an edit programme to produce despatch notes and invoices. To be developed there is a need to be able to forecast branch sales accurately for then inventory can be held at an appropriate level to prevent stock outs occurring. Orders would most likely be aggregated by either a manufacturers' or retailers' computer and ordering be done on a unit lead or weekly basis. The forecasting requirement is necessary because if the system works on a replenishment basis then stock outs will be difficult to prevent and will take time to pick up. Furthermore, when they are picked up, two problems will occur. First an expensive cost to make a special delivery, and second, there will be a tendency for overstocking of that item to occur because the delay will involve a double adjustment of the stock levels, unless an overide can be built in to the programme.

In the long run a system of invoice matching and credit transfer involving a "national data grid" is possible. However, this has a number of problems, the largest of course being data security. The technical problems can be overcome but the security problems associated with mass data transfers will prove a limiting factor.

Inventory management problems may accompany the merger and acquisition activities among manufacturing companies. An obvious cost saving opportunity is offered when two companies with similar products merge. However, in order to achieve scale production economies, long runs are necessary and it is unlikely that the rate of sales can be influenced sufficiently to prevent the increase in inventory holding levels required because of scale production methods.

The current trend in the reduction of facilities locations is likely to continue. Again mergers have had an influence but the largest influence has been cost savings. Therefore although this will continue the rate will clearly be lower. Fewer field locations means less inventory and more control and more service

reliability. One manufacturer has found that by assembling orders in a central location he has reduced picking errors. By shipping these in roll pallets he has increased the delivery rate. In addition to this field locations have been reduced both in number and size.

Costs are clearly the motivating factor. Another manufacturer estimates that to operate a depot system would involve a £one million increase in inventory and that to operate a depot to service London, could involve an increase of some 30% in inventory holding.

It is likely that more manufacturers will turn to the services of the consolidated distribution companies. The reasons given for this are costs of operating field locations already discussed in the previous paragraph, but also because the pressures for more frequent deliveries from retailers with city centre outlets and other small units with increasing space problems. This will involve further cost increases.

Additionally, there is a general opinion that some restrictions will be imposed and that these combined with the cost increases will encourage the use of consolidation services. There could be some dramatic growth depending upon the legislative activity.

Before this growth can take place the consolidation companies must demonstrate their ability to be able to control not only field inventory levels but stock turn of perishables and short shelf life items. It is likely that the largest problem to be overcome is that of warehousing control, particularly order assembly because picking errors are the basis of queries and the hold up of payment. A third party service will be required to demonstrate that these problems will not increase and generally to inspire confidence before dramatic growth occurs. There is little doubt among the companies offering these services that they can overcome this problem.

Consolidation services will offer lower costs and better delivery frequencies because of better vehicle utilization. Other advantages are available due to the fact that both retailers and manufacturers use the service. It has proved possible to lower inventory by merging buffer stocks of manufacturer and retailer in a field location. "Through merchandising" (discussed earlier) is an additional service for manufacturers servicing superstores. Other service extensions are; telephone selling; bonded warehousing, and overseas distribution. The total cost savings would appear twofold. First the costs of manufacturers "doing their own thing" are visibly increasing, and, secondly as the usage rate increases the consolidation service can offset cost savings through increases imposed by the economic environment.

A discussion of the likely developments in consolidation service operations leads into transportation developments. A number of manufacturers do not own vehicles. They argue that the flexibility this affords more than compensates the higher mileage rates. A view which is gaining support following passage of the Dykes Bill. A further consideration of this particular bill is the rate at which it passed through the stages of committees and parliamentry voting. This is felt to be a clear indication of the power of the environmentalists and may signify future, more restrictive legislation.
One view expressed suggests that more use of rail/freightliner will occur after January 1976 because of E.E.C. transport regulations.

Vehicle design is considered likely to develop with distribution. There appear no problems which are likely to develop with distribution changes for which the technology now available is insufficient to solve. Vehicle manufacturers, body builders and handling companies are in tune and aware of current user needs and their developing needs.

Mechanized warehousing is felt to have development potential but because of recent experiences the rate of development may be a cautious one. Thus it is expected that automation may be limited in the forseeable future. What is likely, therefore, is the use of the computer to produce picking cards which will automatically move a picking vehicle to an appropriate location where an item is picked manually, checked electronically and then moved on automatically to the next location. Vehicle loading programmes and scheduling are an extension but cannot be expected for some time to come, probably beyond the time horizon of this exercise.

There is no doubt that unitization developments are well underway now. The need to pass a unit load through the system at minimum cost and delay has been discussed in terms of superstore operations. Other applications are being developed.

One likely development is a stackable roll pallet which will increase both warehouse and vehicle utilization. This will enable the extension of the handling/merchandizing unit to smaller loads. The cost savings are obvious. The roll pallet is in extensive use as a modal unit for order assembly, transport, security storage for out of hours delivery, and staff replenishment. Its present design involves a number of handling operations, with improved design these could be eliminated permitting:

Through merchandizing
Unit load handling
Order consolidation at an early stage in the process

Again there are problems. There is the usual standardization problem, which could be solved reasonably easily at an early stage in development. But the largest problem concerns ownership. The pallet pool problems revolve around ownership and investment problems. However, in the case of a "through merchandising" unit alternatives are appearing, First retailers are convinced of the cost savings potential sufficiently for at least one (there may be others) to supply these containers to the manufacturers. Second, if the consolidation services become involved

at any significant volume, it will be in their interests to supply the units. Finally, a hire system is not impossible nor impractical.

The pallet pool problem is likely to remain, particularly as rising timber prices are likely to increase the prices of pallets to more than double the 1972 prices in 1974. Thus rather than a pallet pool being developed, the future is likely to see changes being made for pallets. One suggestion that was made indicated that a pallet pool would never be formed because government intervention was needed together with more rail movements than there are (or likely to be) in the U.K. The commentator suggested that Switzerland where a pallet pool does work successfully had both these to influence the growth of the pool.

Containerization is not expected to be used to ship goods in large volumes. Manufacturers consider that it is unlikely that even the largest out of town units would have sales volumes likely to warrant such large deliveries and that the economics of containerization are such that haulage rates are better for pallets up to 200 miles and that because of the relatively short hauls in U.K. they cannot see much scope for containerized shipments in the grocery business. Furthermore to obtain maximum economies two-way traffic is necessary,

The same argument is valid when the Freightliner service is considered. Rail freight is only economic over long hauls. The existing pattern of Freightliner services and the likely developments preclude its volume use by manufacturers. Some suggest a possible increase in use subsequent to the introduction of E.E.C. transport legislation.

Other developments in distribution are likely to be apparent during the period. Some combination of facilities by manufacturers has been considered in an attempt at reducing total costs. These have been successful in France, Tokyo and Vancover. By shipping into one central location and consolidating loads for local delivery, total costs have been reduced. This is in fact a similar idea to that of the V.I.P.s discussed earlier, but without the influence and particulation of a local authority.

The success of this type of scheme depends upon the cost and control advantages it can offer over the services offered by consolidation companies. In the light of current price increases and labour cost increases, it would appear doubtful that the cost reductions would be much less than those offered by the services. Against this must be compared the advantages of more flexibility and control. Definite disadvantages can be seen because of the problems of product non-compatability either in terms of contamination or different delivery cycles etc. Thus it would appear that to avoid these problems and also to obtain low operating costs a large scale operation is necessary. This increases the initial investment making it necessary to maximize the use of the system and reducing flexibility.

Two effects of E.E.C. legislation have been discussed elsewhere. However, the likelihood of fellow E.E.C. member manufacturers regaining distribution services is likely.

It is generally considered that there is likely to be development of distribution of productions which are complementary or not considered competitive because of their specialized nature and/or low volumes. At the same time there has developed (and is likely to develop even further) retail consortia to purchase E.E.C. produced goods. The members are smaller multiples who do not compete with each other. Much of the produce has been perishable goods but it is likely that tinned goods can and will be introduced.

This will introduce the eventual need for the facilities to handle containers. Currently the multiples'(and other groups) warehouses are pallet oriented and can handle palletized loads more efficiently and quicker then they can containers.

Computerized system evaluation is available now. One system available offers:

1. Medium Term Planning
   a) The programme examines sales demand by item and depot and prepares shipment forecasts
   b) Gives forecast of annual sales

2. Evaluates Strategies
   a) Planning

      This requires a model of the distribution network links and distances, transport modes and rates. It considers differences in manufacturing costs by location, and also considers differences in manufacturing, depot and transport capacities. With this data it produces alternative distribution strategies.

   b) Operating

      Sales are recorded and exponential smoothing provides forecasts of inventory levels and delivery due dates to maintain a pre-determined service level. The programme allocates inventory for each item for each depot in the system. Delivery quantities (unit loads) can be varied. The programme has the facility for considering the cost implications of low volume deliveries and can consider delivery consolidation

The model operates on two consumptions:

1. No manufacturing restrictions i.e., stock availability at plant

2. Distribution cost minimization

These are constraints because some manufacturers who operate a number of manufacturing facilities would need to consider consolidation problems, and secondly it is often better to approve a system design from the revenue and profit maximizing standpoint

rather than just cost minimizing.

However, before this stage is reached a manufacturer will want to look at physical distribution system planning.

As the trends for future retailing emerge it does seem likely that, with few exceptions, the service requirements and servicing patterns of the developing retail units, can be grouped for planning and costing purposes. It is also very obvious that they are not the same and that it is possible to define distribution missions which group units with similar service requirements. Some of the possible "missions" likely are:

Central Warehouse Deliveries
City Centre Supermarkets
Edge of Town Supermarkets
Edge of Town Superstores
Out of Town Superstores
Convenience Stores (Superettes)
Cash and Carry Operations
City Centre Supermarkets (Direct Delivery)
Edge of Town Supermarkets (Direct Delivery)

For each of these different outlet types it is possible to find specific service requirements in terms of:

Service Level
Delivery Frequency and Variance (and type)
Unitization
Merchandising Service
Ordering Procedures
Invoicing Procedures

While it is not likely that each one will coincide there is sufficient similarity, particularly in the edge of town and out of town superstores as they develop. At the same time during this development period, it is feasible for a manufacturer to influence the service requirements.

With these established it is possible for a system to be designed which considers how each service requirement may be met by the optimum cost-effective combination of the physical distribution activity centres:

Inventory
Warehousing and Handling Facilities
Transportation
Unitization
Communications

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